

DOCUMENT RESUME

ED 124 087

HE 007 956

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TITLE Leadership Assessment and Training Simulation; Field Application and Faculty Training System. Final Technical Report.
INSTITUTION Wisconsin Univ., Milwaukee. School of Business Administration.
SPONS AGENCY Army Research Inst. for the Behavioral and Social Sciences, Arlington, Va.
PUB DATE Jun 75
CONTRACT DAH-C-19-74-C-0042
NOTE 19p.; Not available in hard copy due to marginal legibility of original document

EDRS PRICE MF-\$0.83 Plus Postage. HC Not Available from EDRS.
DESCRIPTORS Behavior Rating Scales; College Faculty; Decision Making; Diagnostic Tests; Educational Games; *Higher Education; Inservice Education; Interpersonal Relationship; Leadership; Leadership Qualities; *Leadership Training; *Management Games; Military Personnel; Military Training; *Program Development; *Simulation; Validity

IDENTIFIERS *Leadership Effectiveness Development Simulation

ABSTRACT

In previous research a pilot simulation was developed for use by Reserve Officers Training Corps (ROTC) units in assessing leadership potential of officer candidates in turbulent-field environments. Peer and instructor rating forms were also developed for evaluation of leadership, decision style, ability to cope with stress, and interpersonal effectiveness. Five objectives were accomplished under the research extension contract reported here: field testing and operationalization of the revised simulation for use on representative ROTC campuses, refinement and preliminary validation of the behavioral style rating scales, development and application of a multimedia training system for instructing faculty in the use of the simulation and assessment battery, and follow-up of the simulation's assessment capability. The final version of the simulation, entitled The Leadership Effectiveness Development Simulation (LEDS), enables participants to develop leadership and interpersonal skills and exhibit realistic and relevant behaviors in these areas for diagnostic purposes. The LEDS can be administered in four 50-minute periods: introduction and initial involvement, the simulation experience, completion and diagnosis, and personal feedback. This report includes a description of the simulation including the setting, physical facilities, roles, simulation operations, scoring and evaluation, leadership diagnosis using the Leadership Description Scale (LDS), and feedback procedure. A list of documents and materials that comprise the LEDS is also included.

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Final Technical Report

LEADERSHIP ASSESSMENT AND TRAINING SIMULATION:

FIELD APPLICATION AND FACULTY TRAINING SYSTEM

Report of Work Accomplished Under Contract

DAH C 19-74-C-0042

at

School of Business Administration

University of Wisconsin-Milwaukee

Sponsored by

U. S. Army Research Institute for Behavioral and Social Sciences

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Phillip L. Hunsaker

Principal Investigator

June, 1975

U.S. DEPARTMENT OF HEALTH,
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INTRODUCTION

A previous research grant awarded to the principal investigator allowed for the development of a pilot simulation model which could be used by ROTC units in assessing the leadership potential of officer candidates in turbulent-field environments. The simulation environment was designed to provide a broad and complex setting which would expose cadets to a variety of military problems typical of those facing leaders at various levels of the military command structure. The setting allowed for assessment of decision-making, leadership and interpersonal skills applicable to a broad range of military situations. Pilot assessment instruments were also developed based on objective behavioral criteria transposed to peer and instructor rating forms. The ratings provided for evaluations of leadership, decision style, ability to cope with stress and interpersonal effectiveness.

This pilot simulation was developed at the ROTC instructor groups at the University of Wisconsin-Milwaukee, University of Wisconsin-Madison and Marquette University. The research extension reported here was intended to provide for further development, field application and testing of the simulation package at representative ROTC campuses across the country. The overall objective was to provide a simulation that would be available for assessment and instructional purposes by all ROTC instructor groups on an optional basis. The proposed tasks included the development of (1) a flexible simulation which is operational across a variety of ROTC instructor groups for both assessment and evaluation purposes, and (2) a multi-media training system for instructors in Senior ROTC groups who wish to utilize the simulation option, and (3) instruments for leadership assessment and skill improvement.

Objectives

Five major objectives were accomplished under this contract:

1. Field testing and operationalization of the revised simulation for use on representative ROTC campuses. After the simulation and assessment procedures were expanded and standardized, different instructional objectives, physical constraints and curriculum variations required that a wide degree of additional flexibility be built into the basic simulation model.

2. Refinement and preliminary validation of the behavioral style rating scales. The behavioral criteria and rating scales were found to adequately differentiate participants along the dimensions of leadership, decision-making and interpersonal skills at the instructor groups utilized for pilot testing. These devices were further modified and validated for wider application in the various types of ROTC programs across the country.

3. Development and application of a multi-media training system for instructing faculty in use of the simulation and assessment battery. The training system developed is self-sufficient in enabling an instructor to understand

all procedures and variations applicable to his evaluation and instructional needs in his specific situation. Written, audio and visual instructions and demonstrations are provided.

4. Follow-up of the simulation's assessment capability. Although the behavioral criteria and rating scales have been found to differentiate among cadets along the previously mentioned dimensions, further testing for predictive and concurrent validity against other field criteria such as advanced summer camp performance, academic performance in other aspects of the ROTC program, or career performance after graduation is desirable. This follow-up will be conducted by ARI representatives during the summer of 1975.

Methodology

1. Field testing and operationalization. Five college campuses across the country were selected as field test sites based on their representation of the different variations of ROTC programs. Campuses selected were Loyola University, Colorado State University, North Georgia College, California Polytechnic State University, Eastern Kentucky University and Saint John's University. As a result, the simulation was further modified by the investigators so that it is appropriate for representative program variations.

2. Instructor Training System. The instructor training system was developed to accompany the simulation. It consists of a color movie film documentary and written instructions. The written material includes the Instructor's Manual, Player's Manual, discussion guidelines, leadership diagnosis manual, rating scales and other explanatory material. The color film documentary (1) provides examples of how to conduct each phase of the simulation and what variations the instructor can expect; (2) provides examples of the various behavioral dimensions the instructor is expected to recognize in order to develop his assessment skills; (3) provides a reliability and validity check of instructor assessment skills; (4) provides examples of modifications which can be made to adapt the simulation to

specific ROTC unit situations.

The instructors on the selected field test campuses were trained through these processes. Evaluations of the training system's effectiveness were solicited to validate its effectiveness. These instructors are now prepared to aid in the broader dissemination of the simulation to other interested ROTC groups.

3. Refinement of Behavioral Style Rating Scales. This was an ongoing activity, which was facilitated during the simulation test applications on the representative ROTC campuses. This additional experience, and following statistical analyses, resulted in a broader, more reliable and more valid battery of rating scales.

4. Follow-up of assessment capability. The primary follow-up data will be generated during the ROTC Advanced Summer Camp to determine the effectiveness of the rating system in assessing cadet capability for leadership. The predictive variables will be scores on the behavioral assessment scales. The criterion variables will be those currently utilized in the Advanced Summer Camp. Other criteria, which will be utilized to test the predictive validity of the assessment instruments, include ROTC academic performance and career performance of officers after graduation.

DESCRIPTION OF THE SIMULATION

The final version of the simulation was entitled The Leadership Effectiveness Development Simulation (LEDS). The simulation enables participants to (1) develop leadership and interpersonal skills, and (2) exhibit realistic and relevant behaviors in these areas for diagnostic purposes. LEDS is not an attempt to teach tactical skills. Even though the setting is a total military decision situation which interrelates economic, socio-political, and tactical dimensions, it is primarily a vehicle for the development and evaluation of leadership and

interpersonal skills. The combat setting is designed only to provide a relevant environment in which interpersonal skills can be learned and diagnosed.

Learning Process

Learning occurs in several ways. Participants learn from each other during the decision-making process as they perform the functions of decision makers and leaders. Self-observation and observation of others in these capacities provide additional opportunities for experiential learning. The instructor-conducted feedback sessions provide a reflective learning experience in behavioral skills. Participants and instructors share with each other relevant feelings and behavioral responses elicited during the simulation in a non-judgemental and constructive manner. Finally, a discussion of military content provides another type of learning experience. Problem solutions and the scoring technique utilized have been created by military officer - ROTC instructors to lend face reality to the simulation. Discussion of the tactical combat problems is suggested as a secondary objective if time permits.

As an evaluation technique, the simulation method has been used extensively in industry, military, education and government settings. The IEDS provides situations which allow opportunities for diagnosing cadets' performance over a wide range of dimensions found in real leadership situations. Instructors are able to observe interpersonal skills in action. Through standardized conditions, observe behavior can be validly diagnosed and legitimate comparisons made between different cadets.

Setting. The simulation setting involves a battalion staff in a military advisory role to a provincial government and a complimentary rebel staff in a small nation shortly after the end of a civil war in which the combating forces were openly backed by opposing world powers.

Two, four-men decision teams compete as Government and Rebel advisory teams. They are provided with detailed maps of the peninsula nation and the specific

province they operate in. Situational problems for the teams to solve and feedback on the outcomes of problem solutions are provided by the game controller.

The complete LEDS can be administered during four 50 minute periods. The first session consists of an introduction and initial involvement in the simulation process. The second period is entirely consumed by the simulation experience. In the third period, participants complete the simulation and undertake the diagnostic function. The final period is devoted to personal feedback.

Physical Facilities. A large map of Shamba peninsula provides the action center for each team. It rests horizontally on the center of a table. Chairs and uniting space at the table are necessary for each team of four simulation participants. Teams should be separated by a partition, or located in separate rooms, if possible. A player's manual must be studied by each participant and controller in advance of the simulation. Map accessories, a supply of planning, action and communication forms and grease pens are available to participants during the simulation. Finally, the game controller requires a supply of game and rating forms. Other forms can be used before, during and after the simulation if research or rating is being conducted (See Exhibit 1).

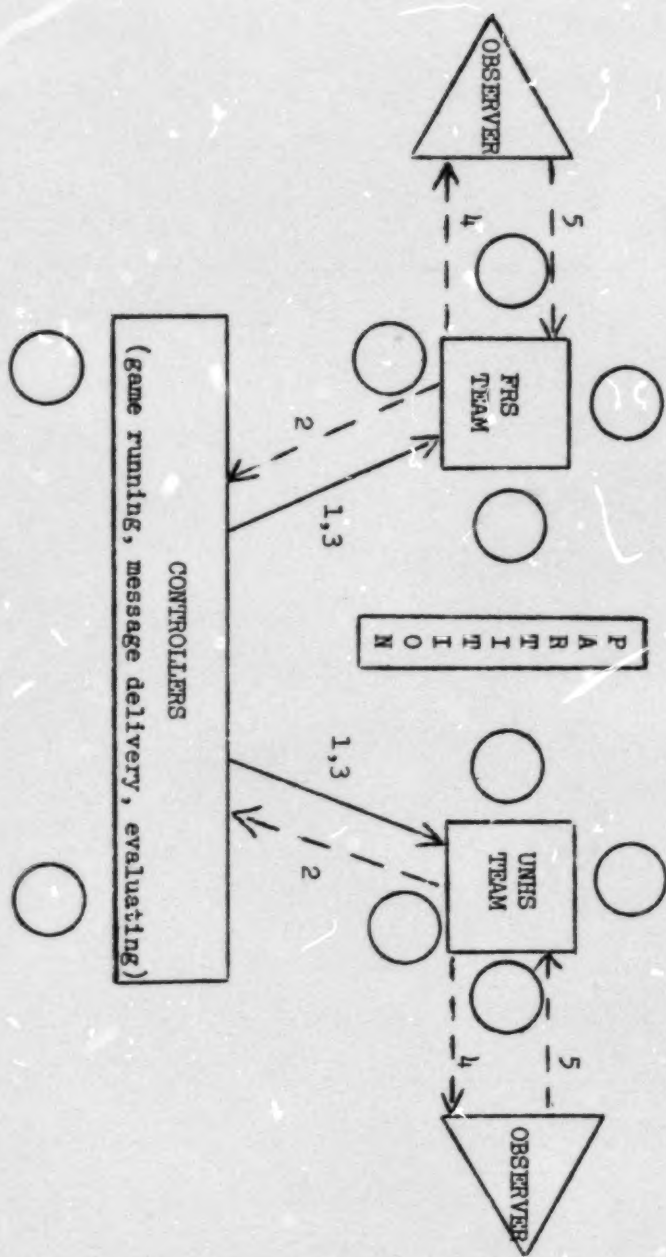
Roles. Each team member is initially assigned to one of four roles: commander, economic specialist, military specialist, or socio-political specialist. Role descriptions indicate such player's area of expertise and responsibility. Interaction and joint decision making is emphasized. In order to allow all participants to (1) be evaluated in the commander (leader) role, and (2) experience all four dimensions of the situation, they are required to exchange roles four times during the simulation.

Simulation Operations. The simulation contains ten problems which the opposing teams have opportunities to solve. The problems are of two types. The first problem format describes a situation and requires the decision team to select the best of three possible alternatives. The second format presents a problem

EXHIBIT 1

LEADS ACTIVITY SCENARIO

1. Controllers give problem cards to teams.
2. Teams return problem solutions to controllers on indicated forms.
3. Controllers provide consequence cards containing problem feedback and scores, plus other evaluation information to teams.
4. - Observers continually watch team members' behavior and complete leadership skills diagnoses, - team members complete leadership skills diagnoses and give to observers.
5. Observers provide feedback and conduct skill building sessions with teams based on their own leadership skills diagnoses and the summaries provided by the team peer evaluations.



situation and requires that team members create their own plan of action to resolve the problem. A typical problem of this sort might be to prepare a defense plan for company headquarters which reportedly will be attacked by enemy forces.

Teams respond to the problems on planning, action, or communication forms. Communication forms may be utilized by either team at any time to relay or request information from the controllers. All team output forms (planning, action, communication) are given to the controller who responds with a message contingent input, or consequence. Consequence feedback is returned to each team after the controller evaluates their problem solution. These inputs include the outcomes of the team's decision (i.e., resulting action and resource change) and the reasons for these outcomes. The selection of consequence inputs is predetermined according to the "Problem-Consequence Schedule." Problem outcomes are posted for teams to see as soon as both have completed the problem and the controller has scored it.

Example of Simulation Operations

The action begins with the simultaneous delivery of problems to each of the opposing teams. The situation for each problem is the same, but the specifics are adjusted to reflect each team's position. For example, the problem or scheduled input received by the Advisory Team representing the Union of North Hemispheric States, UNHS, might be:

A convoy to your location was ambushed. The convoy commander has been seriously wounded; Lt. Ja. Executive Officer, has requested immediate helicopter evacuation. Both sides are exchanging sporadic small arms fire. There is a good possibility that the commander will die if he does not receive medical attention soon. Evaluate the situation and select a course of action.

The problem received simultaneously by the opposing team, the Batu Command Council representing the Free Republic of Shamba, FRS, would correspondingly be:

Your ambush has been successful so far. Most of government ammunition has exploded, government forces have suffered some casualties and will try and evacuate their wounded by helicopter as soon as possible. They might try and reinforce their position. However, this will take about one hour before reinforcements arrive. Evaluate the situation and select a course of action.

The two teams then analyze the problem and select one of three courses of action stated on the scheduled input card. Each team records the course of action it has selected on the action form supplied to them by the controller. The action form is delivered to the controller who scores each team's solution.

Upon receiving the completed action forms, the controller delivers to each team the appropriate feedback card which contains the consequences resulting from the course of action selected, the rationale for such consequences, and a statement of resource outcome, i.e., the number of Resource Units gained or lost because of the course of action selected.

For example, in answer to the helicopter evacuation problem, assume that the UNHS Advisory Team chooses alternative one as the best solution to the problem. They decide to:

approve the request for medical evacuation and send in a helicopter to pick up the wounded commander.

The appropriate consequence card is delivered to the team containing the following feedback:

Consequence: Helicopter sent to rescue wounded personnel in ambush has been shot down.

Rationale: You should not send in a helicopter while there is still fighting. Don't jeopardize an entire helicopter crew to save one man.

Resource Outcome: Your unsuccessful attempt to rescue the wounded effected your military and morale strength. This represents a ten Resource Unit loss.

There is an appropriate feedback card to correspond to each of the alternatives available to each team. When scores for both teams have been determined for a particular problem, the controller posts these scores on the blackboard using the Resource Unit Equivalency Rating System.

Scoring and Evaluation: The Resource Unit Equivalency Rating System

Although decision making in combative conditions is often characterized as a simple win-loss proposition, in the real situation the results of decision making in the conditions are much more complex. The Resource Unit (R.U.) Equivalency System was developed to simulate and emphasize these complexities. These complexities arise from the fact that actions can never be taken in isolation and that they depend on the actions of an opposing action and events and constraints imposed by the situation. The rating is intended to be "fed back" to both sides following the completion of each problem to emphasize that the actions of the teams are interrelated.

Teams encounter each of the ten problems with all resources available. They determine a solution to each problem based on the information supplied on the specific scheduled input card and on an estimation of probable enemy action.

Scoring is cumulative in that the R.U. outcomes awarded a team throughout the series of ten problems are added. A "running total" is maintained for each team to indicate the teams' relative positions during the simulation. Furthermore, the scores received by each of the teams for a particular problem are interrelated in a matrix fashion. The underlying assumption is that in reality, actions can never be considered in isolation. Rather, actions by either team

have an effect on the success or failure of the other team. For example, the UNHS team was awarded -10 Resource Units in the helicopter evacuation problem explained in the previous discussion. According to the R.U. Equivalency System, the team's score of -10 R.U.'s affects the FRS team as well. The FRS team is awarded a +10 Resource Units because of the UNHS team's actions. To complete the example, assume that the FRS team's solution to the helicopter evacuation problem results in a +5 R.U. award. The team's score affects the UNHS team as well. The UNHS team is awarded a -5 Resource Units because of the FRS team's actions. The net total of points received by the UNHS team on the problem is -15; the net total of points received by the FRS team is +15.

Leadership Diagnosis

During the entire game, each participant is diagnosed by an assigned observer. The observer is usually a professor of military science, or other qualified expert. This person's function is to watch how decisions are made and how information is exchanged. At the conclusion of the game, each team member and the observer complete a Leadership Description Scale (LDS). Each team member rates himself and each of his teammates on twelve dimensions of leadership based on actual behavior during the simulation. The observer appraises each team member using the same LDS form.

Leadership Description Scale. One item or question in the LDS is used to describe behavior on each of twelve leadership dimensions. Each dimension is described in terms of two extremes. The most effective behavior which might be observed is rated as "high" and has a value of seven. The least effective behavior which might be observed is rated as "low" and has a value of one.

Three aspects of leadership are diagnosed. These are:

1. administrative competence,
2. decision making skills, and
3. team-building expertise.

Scoring the LDS. The LDS is designed so that each of the three leadership aspects is defined by the sum of eight of the twelve dimension ratings. Administrative Competence, for example, is defined by the sum of a cadet's rating on dimensions of: communicates effectively, provides team structure, sets goals and priorities, motivates team members, shows high degree of task motivation, demonstrates team building skills, shows personal influence, coordinates team operation. The instructor analyzes the Leadership Description scales for each team on a Team-member Comparison Summary (TCS) which serves as an analysis summary. The final step in completion of a team's TCS is to rank cadets by dimension, aspect and overall leadership exhibited.

Feedback Procedure

This last 50 minute period is extremely important in providing a behavioral skill development opportunity (i.e., decision-making and interpersonal relations process feedback). Instructors take notes regarding the participants' decision-making processes and interpersonal behavior during the simulation. These observations, in conjunction with peer and assessor diagnoses, provide the data for feedback on interpersonal effectiveness. Concrete examples are extremely important in documenting feedback regarding the impact of an individual's actions on others.

Guidelines for discussion of military content are also provided. This phase of the learning experience provided by LEDS is secondary. Problem solutions and interpretations have been created by military officers who are ROTC instructors, but they are not to be considered singularly correct answers. A discussion of tactical content may be conducted if it is desired.

DOCUMENT AND MATERIAL SUMMARY

The documents and materials which comprise the Leadership Effectiveness Development Simulation (LEDS) include the following:

- A. Instructor's Manual
- B. Player's Manuals
 - 1. 4 FRS Team Manuals
 - 2. 4 UNHS Team Manuals
- C. Simulation Input Cards
 - 1. Scheduled Input Cards
 - a) 10 FRS problems
 - b) 10 UNHS problems
 - 2. Filler Input Cards
 - 3. Contingent Input Message Forms
 - 4. Consequence Input Cards
- D. Simulation Output Forms
 - 1. Planning Forms
 - 2. Action Forms
 - 3. Communication Forms
- E. Assessment Forms
 - 1. Leadership Description Scales (LDS)
 - 2. Team-member Comparison Summaries (TCS)
- F. Resource Unit Rating Forms
- G. 2 Game Maps

H. 2 Sets of Role Cards

1. Commander
2. Economic Advisor
3. Socio-Political Advisor
4. Military Advisor

I. Blackboard

J. Miscellaneous Materials

1. Color Keys for Force Markers
2. Force Markers
3. Grease Pencils
4. Push-pins
5. Writing Pencils
6. Writing Tablets
7. Clock

K. Training Film

RELATED RESEARCH

The following research papers were completed in conjunction with the development of the training simulation. Three of the four, summarized below, have subsequently been published in books or journals.

A Tactical Pacification Game for Leadership Development. Psychological Reports, 1975, 36, 439-445.

Summary - The structure of the Tactical Pacification Game is described and applications for evaluating and developing leadership competence are explained. Relevant research paradigms and specially developed measurement instruments are presented as they relate to the study of leadership and decision making. Examples of current and future applications of the simulation are presented.

A Method of Analyzing Perception within Small Groups. Working Paper (Army Research Institute Series 74-4) University of Wisconsin-Milwaukee, 1974.

Summary - Frequently small group task team members are asked to provide questionnaire data describing themselves and their teammates at the end of group exercises. This report presents a method for extracting sociometric perceptual appraisals of each team member. The number of questionnaire items and the number of individuals on a team may be varied. However, both the conceptual method and the appended computer programs require that each response to every questionnaire item link the individual being described to one of four categories in a two-by-two classification scheme.

THE LEADERSHIP ASSESSMENT AND TRAINING
SIMULATION: TRAINING, ASSESSMENT AND
RESEARCH APPLICATIONS.

Catalogue of Selected Documents in Psychology,

Journal Supplement Abstract Service

Fall, 1974

Summary - The Leadership Assessment and Training Simulation (LATS) was developed in response to the increasing need to assess and train leaders who can cope effectively with turbulent decision environments. The simulation structure, scenario and use requirements are described as well as past applications in training, assessment and research. Techniques for data collection and analysis are discussed and a range of future applications are explored.

A Human Information Processing Approach to the Process of Leadership, Chapter in Leadership Frontiers, Kent State University Press, 1975 and Article in Organization and Administrative Sciences (in press, 1975).

Summary - A new model of leadership processes based upon human information processing concepts is proposed as a research paradigm. A review of recent leadership literature emphasizing the path-goal approaches is integrated with research findings in cognitive style, motivation and in human information processing behavior to develop the model. General and specific leadership propositions are drawn from the model, and specific hypotheses are provided for future research efforts.